Remarks

Claims 1-20 are cancelled, and new claims 21-38 are added in their place. No new matter is added. The new claims are supported in the original specification on
page 38 line 18-27 (claim 21); page 38 line 28 to page 39 line 9 (claim 22);
page 39 line 10 to 18 (claim 23); page 39 line 19 to 27 (claim 24);
page 39 line 28 to 30 (claim 25); page 40 line 1 to 2 (claim 26); page 40 line 3 to 16 (claim 27);
page 40 line 17 to 26 (claim 28); page 40 line 27 to page 41 line 3 (claim 29 and 30);
page 41 line 3 to 6 (claim 31); page 41 line 7 to 10 (claim 32).
Claims 33-38 are means-plus-function claims supported on page 38 line 18 to page 41 line 10, and elsewhere in the specification and Figures.

The pending claims 21-38 appear in condition for allowance, and such action is respectfully requested. Please telephone Applicant's Attorney Charles Lemaire at 612-373-6949 if there are any questions.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on this 13th day of December, 2002.

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Signature

Clean copy of the claims

What is claimed is: ATTORNEY DOCKET 1014.010US3

21. [New] An integrated photonic apparatus comprising:

a glass substrate having a major surface;

an input signal waveguide formed along the major surface of the substrate;

an output signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate;

a drop signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate; and

a first grating formed on the output waveguide, wherein the first grating reflects a first wavelength and is transparent to a plurality of other wavelengths, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths is passed through to an exit interface of the output waveguide.

22. [New] The apparatus of claim 21, further comprising

a second grating formed on the output waveguide,

wherein the first and second gratings are each electrically activatable, and wherein the first grating when activated reflects a first wavelength and is transparent to a plurality of other wavelengths including a second wavelength,

wherein the second grating when activated reflects the second wavelength and is transparent to a plurality of other wavelengths including the first wavelength,

such that when the first grating is activated and the second grating is deactivated the first wavelength is passed to the drop waveguide and the second wavelength is passed through to the exit interface of the output waveguide, and

when the second grating is activated and the first grating is deactivated the second wavelength is passed to the drop waveguide and the first wavelength is passed through to the exit interface of the output waveguide.

23. [New] The apparatus of claim 22, further comprising

an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate, wherein the add waveguide has a higher index of refraction than an index of refraction of adjacent portions of the substrate, and wherein the first grating reflects a first wavelength and is transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

24. [New] The apparatus of claim 21, further comprising

an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate, wherein the add waveguide has a higher index of refraction than an index of refraction of adjacent portions of the substrate, and wherein the first grating reflects a first wavelength and is transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

25. [New] The apparatus of claim 21, wherein all interfaces to couple light between the substrate and external devices are formed at a single face of the substrate other than the major surface of the substrate.

26. [New] The apparatus of claim 21, wherein each waveguide has a higher index of refraction than an index of refraction of adjacent portions of the substrate.

27. [New] A method comprising:

providing a glass substrate having a major surface, an input signal waveguide formed along the major surface of the substrate, an output signal waveguide formed along the major surface of the substrate, and optically coupled to the input waveguide, and a drop signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the

substrate;

launching input signal into input waveguide;

adding pump light to at least one of the input waveguide and the output waveguide;

receiving a drop-wavelength signal from the drop-signal waveguide; and

selectably applying a first wavelength-sensitive transfer function to light in one of the waveguides that reflects a first wavelength and is transparent to a plurality of other wavelengths, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths is passed through to an exit interface of the output waveguide.

28. [New] The method of claim 27, further comprising

selectably applying a second wavelength-sensitive transfer function to light in one of the waveguides that reflects the second wavelength and is transparent to a plurality of other wavelengths including the first wavelength, such that when the first transfer function is activated and the second transfer function is deactivated the first wavelength is passed to the drop waveguide and the second wavelength is passed through to the exit interface of the output waveguide, and when the second transfer function is activated and the first transfer function is deactivated the second wavelength is passed to the drop waveguide and the first wavelength is passed through to the exit interface of the output waveguide.

29. [New] The method of claim 28, further comprising

providing an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate; and

launching a third wavelength into the add waveguide, wherein the first transfer function reflects a first wavelength and is transparent to a plurality of other wavelengths, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

30. [New] The method of claim 27, further comprising

providing an add signal waveguide, optically coupled to the output waveguide, and

formed along the major surface of the substrate; and

launching a third wavelength into the add waveguide, wherein the first transfer function reflects a first wavelength and is transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

31. [New] The method of claim 27, further comprising

coupling light between the substrate and all external devices from a single face of the substrate other than the major surface of the substrate.

32. [New] The method of claim 27, further comprising

applying a first wavelength-sensitive transfer function to light in one of the waveguides that is complementary to a gain curve of the active species of the substrate in order to flatten a gain curve of the apparatus.

33. [New] An integrated photonic apparatus comprising:

a glass substrate having a major surface;

an input signal waveguide formed along the major surface of the substrate;

an output signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate;

a drop signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate; and

first means for passing a first wavelength to the drop waveguide and passing a plurality of other wavelengths through to an exit interface of the output waveguide.

34. [New] The apparatus of claim 33, wherein the first means selectably pass the first wavelength, and further comprising

means for selectably passing a second wavelength to the drop waveguide while passing

the first wavelength through to the exit interface of the output waveguide.

35. [New] The apparatus of claim 34, further comprising

an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate, and wherein the first means reflect a first wavelength while being transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

36. [New] The apparatus of claim 33, further comprising

an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate, and wherein the first means reflect a first wavelength while being transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

37. [New] The apparatus of claim 33, wherein all interfaces to couple light between the substrate and external devices are formed at a single face of the substrate other than the major surface of the substrate.

38. [New] The apparatus of claim 33, wherein each waveguide has a higher index of refraction than an index of refraction of adjacent portions of the substrate.